The "Tank" Dinosaurs and the Little Germs that Wiped Them Out

The Terrible Skull of Rex Tyrannosaurus from Montana, with Teeth Six Inches Long, Compared with the Skull of an Average Man.

"Tyrannosaurus with his terrible teeth could have swallowed a man at a gulp or bitten a man-eating tiger in two with ease."
—*From a Drawing Made by Erwin Christman of the American Museum of Natural History.*

The Skeleton of Tyrannosaurus, 18 Feet, 6 Inches High, and 47 Feet Long, as It Now Stands in the New York Museum of Natural History.

Science's Discovery That Disease-Carrying Insects Ended the Existence of These Flesh Devouring Monsters That Once Threatened to Exterminate All Higher Life on Earth

By W. H. Ballou, D. Sc.

THE New York American Museum of Natural History has recently acquired and put on exhibition the most powerful flesh-eating monster that ever lived—Tyrannosaurus Rex, of Montana.

The exhibition of Tyrannosaurus raises more acutely than ever the puzzling question, how and why did these monsters become extinct?

It was long ago argued that the rising tribes of man-like creatures and other mammals put an end to these overgrown terrors, but this has been shown to be untenable, for Tyrannosaurus had 250 times the biting power of the largest man-eating tiger, and no warm-blooded animal would have had a chance against the great armored dinosaurs. Those man-like creatures which may have existed then were small and unarmed, and were obliged to keep to the treetops for safety.

Then again it was asserted with more apparent reason that the great carnivorous dinosaurs became extinct because there were not enough animals to nourish them—there was a prehistoric meat shortage, in fact. But recent research has disposed of this argument, for it has been shown that there was an abundance of small herbivorous dinosaurs and, in the latest period, of mammals to satisfy the exacting appetite of Tyrannosaurus.

These facts and certain new discoveries have now forced scientists to the conclusion that only deadly germs carried by insects could have put an end to the monstrous race that once threatened the existence of all higher animal life on our earth. The insects conveyed the germs to the dinosaurs as the mosquito carries malaria germs and the tsetse fly sleeping sickness.

These deadly germs were really the means of saving the world.

Dr. Henry Fairfield Osborn, in his "Age of Mammals," has thus stated the problem of the disappearance of the great dinosaurs:

"At that time (the upper cretaceous period) in the Rocky Mountain region land animals only were known. Chief among the herbivorous forms were the giant Trachodons, or duck-bill dinosaurs; the great paired-horn dinosaur Triceratops, and the armored ankiyosaurs. All were subject to attack by Rex. These reptiles were the climax of specialization and grandeur; they moved amid a stately flora of palms and sequoias, interspersed with banana and fig trees, and a very rich deciduous tree flora of moderate south temperate type. There were many small mammals, but they were of humble and inconspicuous forms.

"We have no conception as to what world-wide cause occurred, whether there was a sudden or a gradual change of conditions at the close of the cretaceous period; we can only observe the world-wide effect—that the giant reptiles of both land and sea disappeared. Reptiles are so sensitive to temperature that it is natural to attribute this extinction to a general lowering of temperature, or refrigeration, but the flora shows no evidence of it either in Europe or America. Nor is there any evidence of any great geographic cataclysm on the surface of the earth, for the plant life transition from one age to another in the Rocky Mountains is altogether gradual and gentle."

We see from this that the climate was tropical, which would have favored the growth of insects and parasites. Now, recent authorities have told us how an insect pest—the tsetse fly—has been exterminating vast herds of great animals and tribes of men in Africa. It should be noted that the same insect could have attacked the reptile-like Tyrannosaurus, for to-day this fly is exterminating that great African reptile the crocodile. Concerning this insect pest, Dr. Walter B. James, president of the New York Academy of Medicine, said:

"Whole tribes of African blacks have been annihilated by the sleeping sickness caused by the parasite Trypanosoma Gambiense, born in the body of the tsetse fly. It has been suggested that in parts of Africa most affected the wild game should be killed off, for it has been shown that mammals, too, may be hosts of such parasites, and thus help to perpetuate them. One of the most peculiar of all tropical diseases is filaria, caused by the parasite of that name. In the blood of persons suffering from it are found innumerable little worms seen under the microscope. These circulate in the blood only at night, hiding in the body in daytime. The parasite is conveyed into the blood of animals by the bite of certain kinds of mosquito. The result is an enormous enlargement of the arm, hand, leg or foot, and hence the disease is termed elephantiasis. There is another filaria, loa, which produces uncomfortable swellings, transmitted by the bite of the mangrove fly, a common, blood-sucking insect. Then there is the African parasite called the guinea worm. Its larvae exist in water, where they are absorbed by the aquatic creature called the cyclops. Natives drinking the water become affected. In India the natives, carrying water-skins on their back, present fine opportunities for the parasite to get lodgment under the skin of their backs. Science offers us the only hope of victory over these and other devastating parasites."

Dr. Edmund Heller, in a recent address before the New York Academy of Sciences, told how vast herds of mammals have been exterminated by African parasites, and suggested that herein might be found the cause of so much extinction of past animal life in other ages of the world.

Positive evidence that parasitic bacteria caused the extinction of some prehistoric animal races has been discovered in a microscopic examination of fossil mammal bones found in Pennsylvania. The parasites were found fossilized along with the skeletons.

Dr. Hervey W. Shimer, of the Massachusetts Institute of Technology, in his new work on "The Study of Fossils," thus outlines this new theory of the destruction of prehistoric monsters:

"It has been suggested that a corollary cause in the extinction of the horse in Pleistocene times in North America may have been some epidemic disease, or diseases, carried by some fly, tick or other parasite-bearing insect; the multiplication and spread of such insects increased by the spread of a moist climate. During the Middle Pleistocene times North America was covered with herds of mastodons, many varieties of elephants, large llamas, camels and enormous numbers of horses. Of horses there were at least ten species. Prog-horned antelopes, white-tailed deer, peccaries, giant sloths and glyptodons were also abundant. Preying upon these were the sabre-tooth tigers, as well as large lion-like cats and giant dogs. All perished."

A personal interest in the disappearance of these monsters will be felt by every one who looks at the skeleton of Tyrannosaurus Rex, the last and most terrible of the dinosaurs, in the American Museum.

He could have bitten a tiger in two with a snap of his awful jaws.

His terrible head rises nineteen feet above the floor. Upon his back and part way down his tail were leather plates similar to those of the alligator, but many times thicker. Against this armor the most powerful rifle carried by modern man would have been useless. The monster was, in fact, a living armored tank. The only chance of injuring him would have been to shoot him in one of his small eyes, and this would have been almost hopeless. It would, in fact, have required artillery to attack this monster, and, needless to say, primitive man possessed no such weapon. Prehistoric man would have been utterly helpless before the monster.

Careful calculations have shown that this flesh-eating dinosaur possessed at least 20,000 times the biting power of the average man. The man's biting power is equivalent to ten pounds and that of Tyrannosaurus would therefore be 200,000 pounds.

Tyrannosaurus became extinct after four million years of dominance three million years ago, and before any real human beings existed. As it was, primitive men had plenty of savage animals to contend with, but knew enough to stick to the tree-top life until they were strong enough in numbers to venture into the protection of caves. It is also certain that the far-off ancestor of man, which existed in the time of Rex, was some small placental mammal of an insect-eating type, which also kept close to the tall timber to escape providing dinners for dinosaurs. The function of this ancestor was to evolve masticating teeth for his descendant, man, rather than biting, snapping and crushing teeth. As a biter, man has all he can do to chew a tough steak, assisted by a sharp knife.

Dr. Barnum Brown, associate curator of extinct reptiles at the American Museum, is the man who gathered in the perfect skeletons of Rex. He has modified his views considerably concerning the monster, since he first got merely parts of skeletons. Defining his new conception of Rex, he said:

"Tyrannosaurus is a gigantic reptile distinctly related to lizards, crocodiles and birds. Its hind legs are formed like those of birds and the bones are pneumatic (hollow). It was a powerful creature, doubtless swift of movement when speed was demanded. It was capable of destroying any contemporary creatures—a king of the period and the monarch of its race. The rear view of the skeleton shows the narrow, bird-like construction of the pelvis and compact rib-basket.

"The massive proportions of the great hind limbs bend forward at the knee, as in birds, instead of outward, as in crocodiles and lizards. The skeleton is forty-seven feet long from tip to tip and eighteen and one-half feet high from top of skull to ground. The knee joint is six feet above ground. The skull is over four feet three inches long, three feet four inches deep, and two feet nine inches wide.

"The bones, fossilized, weighed two tons, after six men had spent two years in chipping them out of solid red sandstone. A block of sandstone alone containing the pelvis weighs 4,150 pounds. The stride of Rex in walking was seven feet, in rapid motion twelve feet. In mounting, besides steel rods for support, clamps of flat steel were used to line the bones and hold the vertebrae together. There were twelve teeth in the maxillary series and certainly one or two in the premaxillary, conical in shape, ovate in cross section. The teeth were from three to six inches long and an inch wide.

"Dawn glows along the shore of a lagoon near the sea three million years ago in Montana. The landscape is in low relief; sycamores and ginkgo trees mingle with figs, palms and bananas. There are a few twittering birds in the tree tops and no herds of grazing animals to greet the early sun. A huge herbivorous dinosaur, Trachodon, coming on shore for some favorite food, has been seized and partly devoured by a gigantic Rex. Another giant Rex approaches and interrupts the feast. The stooping animal hesitates, partly rises and prepares to spring on its opponent. With colossal bodies poised on massive hind legs, steadied by long tails, ponderous heads armed with sharp, dagger-like teeth three to six inches long, front limbs smaller but set for a powerful clutch, they are the very embodiment of dynamic animal force. Rex was the largest flesh-eater on land of all ages."

It is strange to think of this supremely terrible creature withering away under the bite of a tiny insect pest. His mighty limbs tremble and refuse to move, his frame sags down, his eye grows dull and his jaws fall to snap on their prey. The last descendant of the most terrible race the earth ever knew sinks to a miserable death.

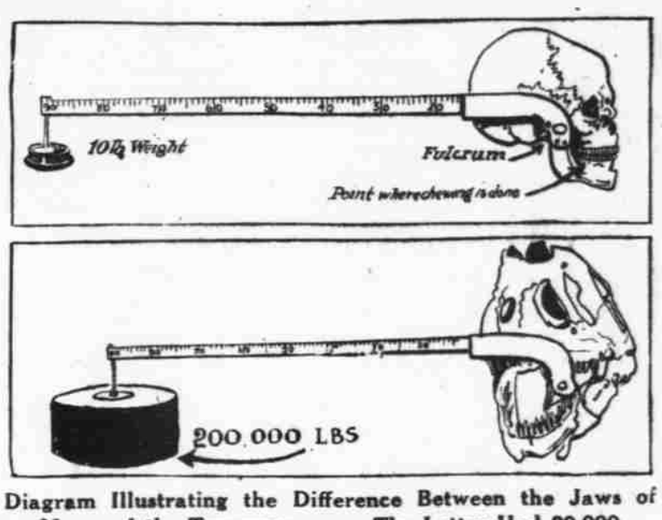

Diagram Illustrating the Difference Between the Jaws of Man and the Tyrannosaurus. The Latter Had 20,000 Times the Biting Power of a Man.